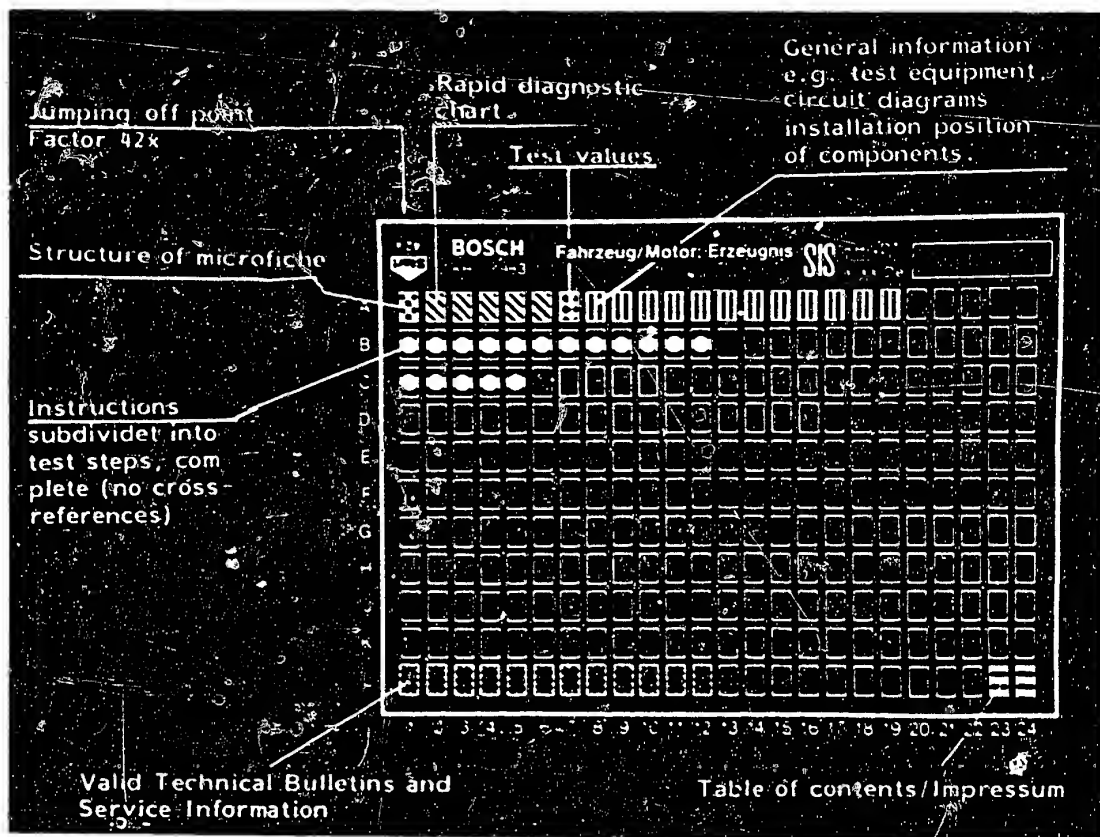


Structure of microfiche



1. Read from left to right
2. Title of microfiche (appears on each coordinate)

E16	Product/component/test step
	Vehicle/engine

↑ Coordinate

3. Limits of section



Beginning



Mid-section



End



One-page section

4. Purely vehicle-specific passages in the text are marked with a vertical bar.

5. Reference to relevant working steps in the test specifications, e.g. coordinate C6.

C6

A1

Trouble-shooting program



1. Special features

Ford Escort as of 9.80

Trigger box 1 227 022 003 * (with current limitation)
or

Trigger box AC Delco ** (with current limitation)

Ignition coil 0 221 122 030, ... 031

** Ford service part

* Bosch trigger box can also be mounted on Lucas
ignition distributor.

2. Rapid diagnosis chart

The following rapid diagnosis chart makes it possible for the experienced expert to quickly check the electrical/electronic part of the ignition system using normal workshop test equipment.

The rapid diagnosis chart contains the following information:

- Customer complaint
- Cause of trouble
- Test instructions (further test possibilities are indicated at this point if there is no coordinate reference given on the right).
- Coordinates for detailed trouble-shooting.

If detailed information and instructions are required on trouble-shooting, always proceed according to the trouble-shooting program starting on Coordinate B 1.



Rapid diagnosis chart

Customer complaint (fault symptom)

1. Starting motor operates, engine fails to start
2. Rough idle
3. Poor throttle response (flat spot on acceleration)
4. Engine lacks power
5. Misfiring
6. Fuel consumption too high
7. Engine pinging during accelerating
8. Backfiring
9. Engine overheating

									<u>Cause of trouble</u>	<u>Test instructions</u>	<u>Coordinates</u>
●	●	●	●	●	●			●	Spark plugs defective	Evaluation with ignition oscilloscope or visual examination of spark plug when removed	---
●	●	●	●	●	●	●	●	●	Ignition timing incorrect	see Autodata test specifications	---
●	●	●	●	●					Shunt on secondary side	Evaluation of ignition coil, ignition distributor, ignition harness and spark plug by means of ignition oscilloscope/visual examination	---
●	●	●	●	●					Open circuit on secondary side	Evaluation of ignition coil, ignition distributor, ignition harness and spark plug by means of ignition oscilloscope or continuity test with ohmmeter	---
●									Open circuit on primary side	Check power supply to trigger box and primary circuit for open circuit	C 3
●	●	●	●	●					Ignition coil defective	Visual examination, electrical test	B 5

A3

Rapid diagnosis chart
Ford



A4

Rapid diagnosis chart
Ford



Rapid diagnosis chart

Customer complaint (fault symptom)

1. Starting motor operates, engine fails to start
2. Rough idle
3. Poor throttle response (flat spot on acceleration)
4. Engine lacks power
5. Misfiring
6. Fuel consumption too high
7. Engine pinging during accelerating
8. Backfiring
9. Engine overheating

									<u>Cause of trouble</u>	<u>Test instructions</u>	<u>Coordinates</u>
		●	●	●	●				Interference-suppression resistors defective	Evaluation by means of ignition oscilloscope/resistance measurement	---
	●	●	●		●	●	●		Centrifugal advance defective	see Autodata test specifications	---
		●	●		●	●		●	Vacuum advance defective	see Autodata test specifications	---
●									Trigger box defective	Check output stage, primary circuit.	B 11
●									Ignition-distributor pulse generator defective	Check resistance, short circuit to ground of coil section. Check ignition pulse generator for mechanical damage	C 1
●	●	●	●	●					Engine-speed limiter defective	Check cutoff speed/visual examination	---
●									Firing sequence incorrect	see Autodata test specifications	---

A5

Rapid diagnosis chart
Ford



A6

Rapid diagnosis chart
Ford



3. Test specifications

Ignition coil, primary	0.6...1.1 Ω
------------------------	--------------------

B5

Ignition coil, secondary	4.4...8.7 k Ω
--------------------------	----------------------

Power supply to ignition coil	≥ 10 V
----------------------------------	-------------

B9

Output stage with ignition on	0 V
----------------------------------	-----

B11

Primary voltage with engine idling	Bosch	310...390 V
	AC Delco	310...450 V

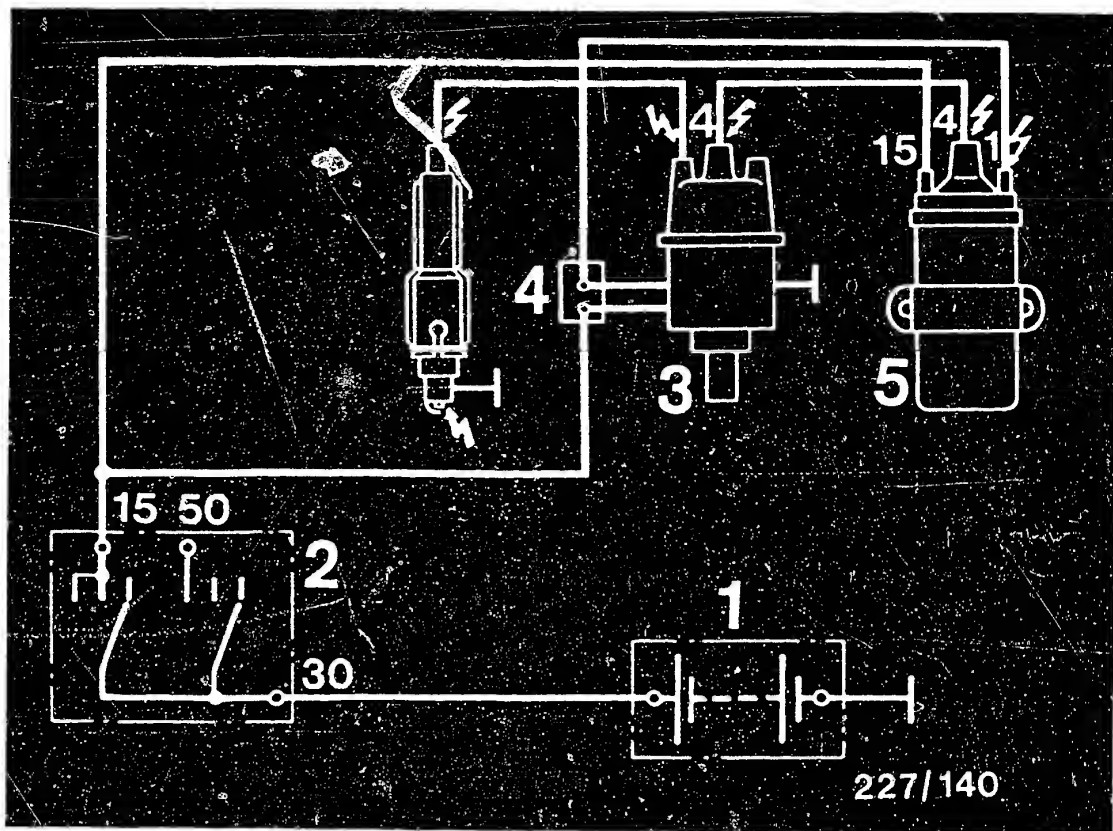
Resistance of coil section		
	Bosch	630...1150 Ω
	Lucas	2.7...3.9 k Ω

C1

Short circuit to ground of coil section	$R = \infty$
--	--------------

See Autodata test specifications for settings for
ignition, idle speed, exhaust, valve clearance etc..

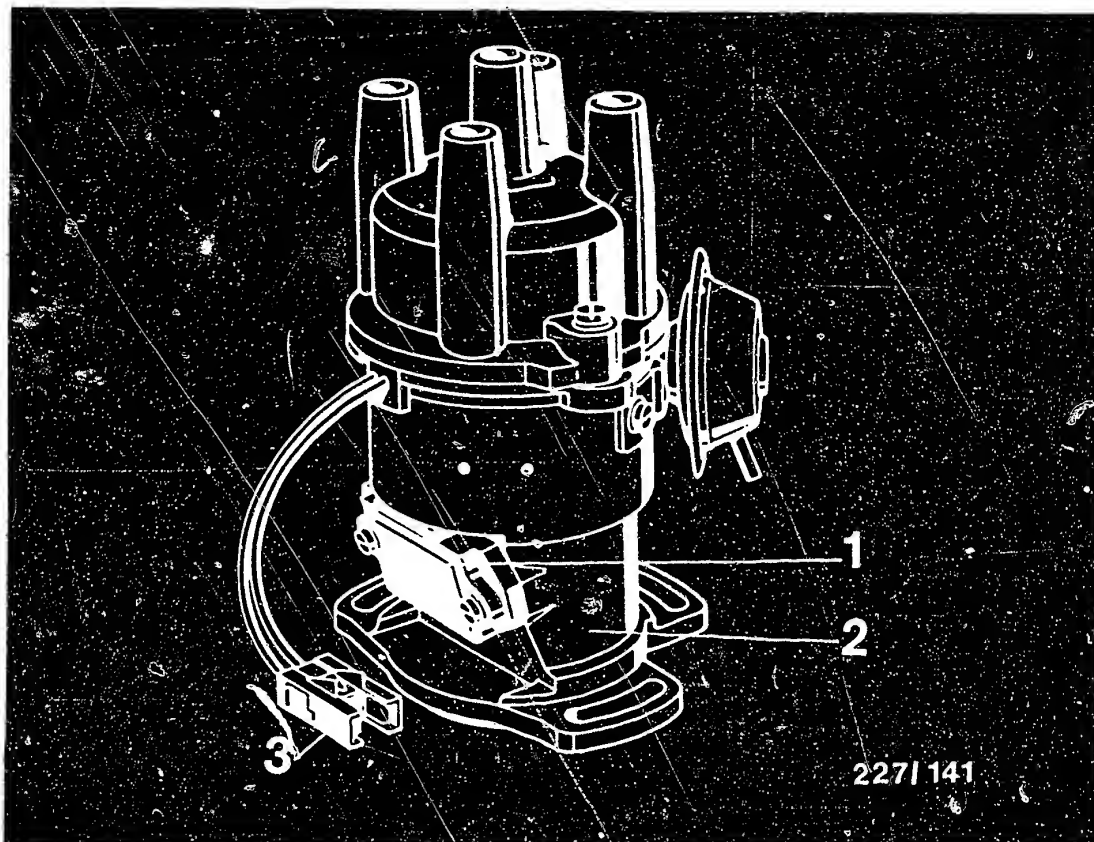




- 1 = Battery
- 2 = Ignition and starting switch
- 3 = Ignition distributor with trigger box
- 4 = two-pole ignition distributor connector
- 5 = Ignition coil

Danger arrow: Warning: 400 V ... 25 kV

4. Electrical terminal diagram



- 1 = TI-I trigger box
- 2 = Ignition distributor
- 3 = two-pole ignition distributor connector

5. Installation position of components

The trigger box is screwed onto the ignition distributor.



6. Necessary test equipment, aids

Motortester e.g.	MOT 201	0 684 000 201
Spark gap e.g. ignition coil and capacitor tester	EFAW 106A	0 681 100 001
or single spark gap	EF 1177/7	1 684 531 000
Sleeve-type suppressor 5 k Ω		0 356 500 001
Ohmmeter or e.g.	ETE 014.00 Pontavi Wh2	0 684 101 400 commercially available
Voltmeter e.g.	ETE 014.00	0 684 101 400
Adapter for ignition coil and		1 684 448 115 1 684 448 117
Thermal conduction paste		5 942 860 003
Silicone paste		5 700 083 005
Test prods		commercially available



7. Danger of accident on electronic ignition systems

Increased demands of modern engines on the ignition system and the desire for freedom from maintenance have recently led to the use in series production of electronic ignition systems. Usually, the ignition power of electronic systems (of almost all manufacturers) is higher than that of conventional systems; there are signs of further increases in power. Electronic ignition systems thus enter a power range which can be extremely dangerous if live parts or terminals are touched (both on the primary as well as on the secondary sides).

In this connection, we should like to draw your attention to the fact that the VDE regulations, in particular VDE 0104/7.67, or the corresponding local regulations must be followed when working on or testing the ignition system.

Always switch off the ignition when working on the ignition system (switch off ignition/voltage source). Such work includes:

- Connection of motortesters (timing light, dwell-tach tester, ignition oscilloscope etc.).
- Replacing of parts of the ignition system (spark plug, ignition coil, ignition distributor, H.T. ignition cable etc.).



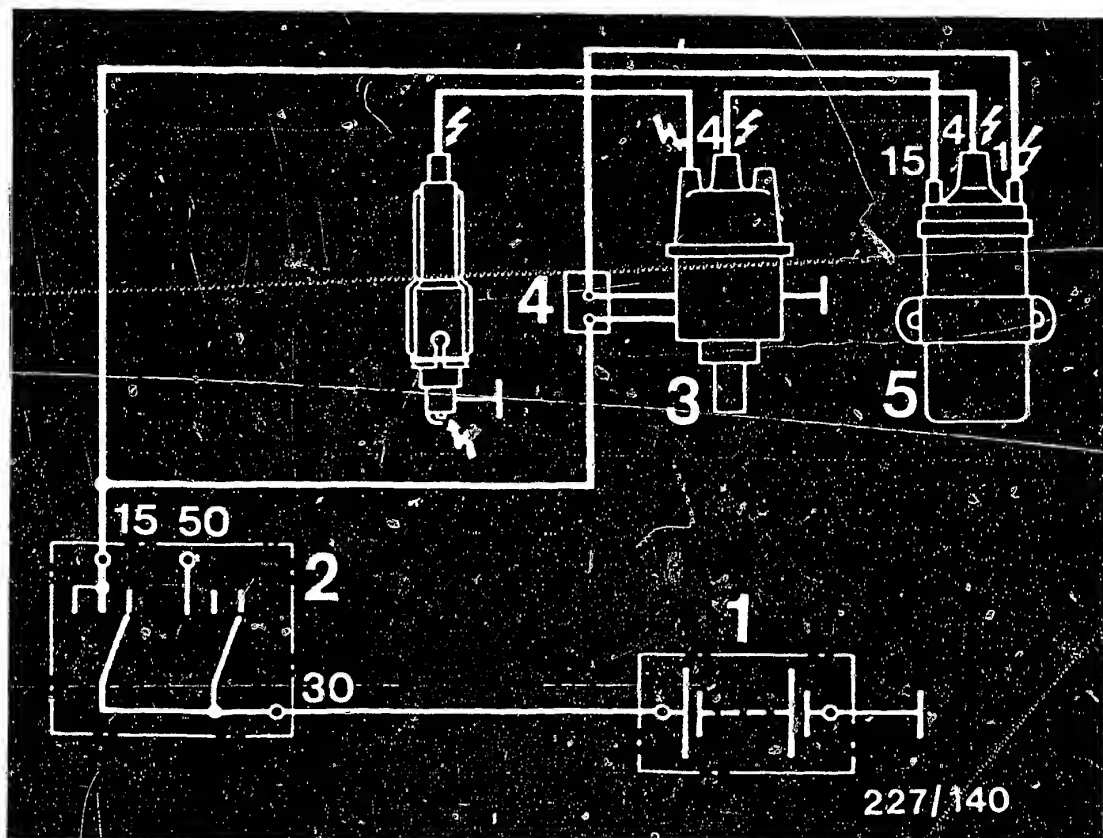
If, when testing the ignition system or when performing adjustments on the engine (e.g. carburetor), it becomes necessary to switch on the ignition (switch on ignition/voltage source), the aforementioned dangerous voltages occur over the entire system.

The danger of accident exists, therefore, not only on the individual components of the ignition system (such as ignition distributor, ignition coil, trigger box, ignition harness), but also on the wiring harness (such as tachometer connection, diagnostic plug), at plug-in connections and at test equipment.

A12

Danger of accident
Ford





- 1 = Battery
- 2 = Ignition and starting switch
- 3 = Ignition distributor with trigger box
- 4 = two-pole ignition distributor connector
- 5 = Ignition coil

Danger arrows: Warning: 400 V ... 25 kV

Electrical terminal diagram

The dangerous locations are identified by danger arrows taking the example of the terminal diagram of an electronic ignition system.

8. Incorrect indication of engine speed, dwell angle and ignition point

On ignition systems with

trigger box 1 227 022 003 (TI-I)
and those of Delco with current
limitation

there may be an incorrect indication of engine speed,
dwell angle and ignition point on testers.

For further information see Coordinates L 8 - L 12.



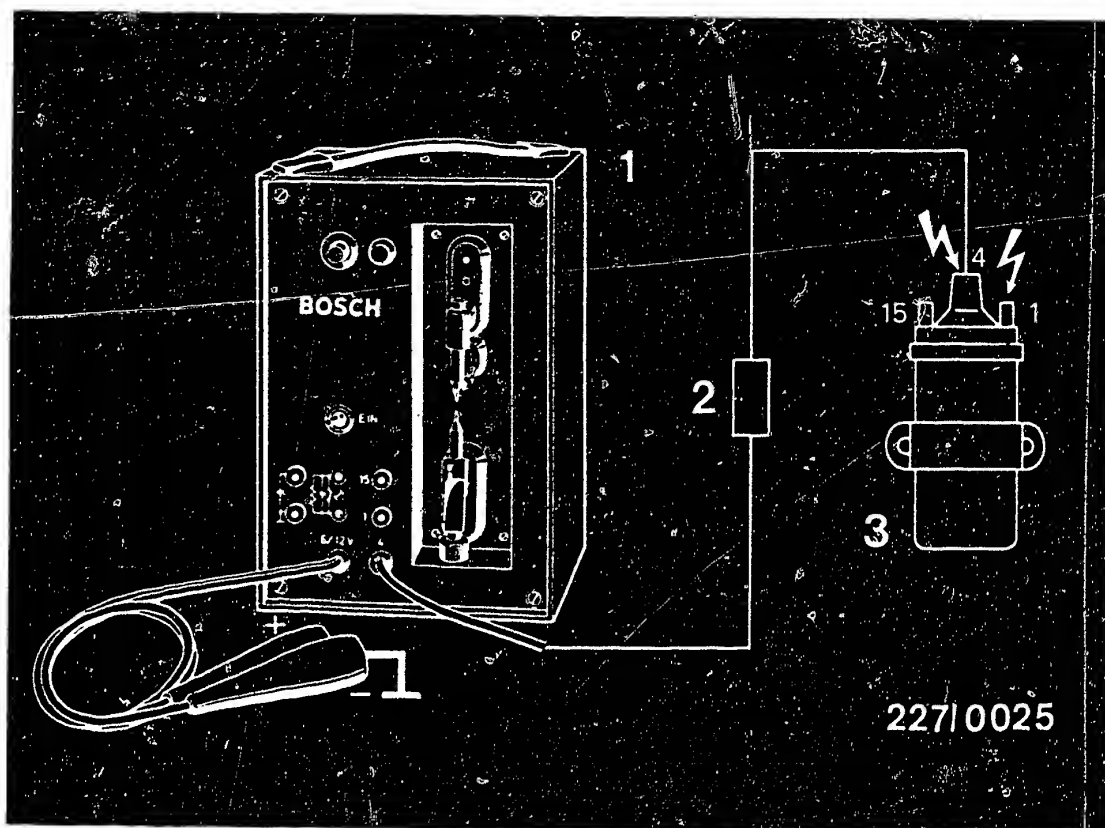
9. Important vehicle information

- When testing compression, disconnect trigger-box plug or firmly ground ignition coil term. 4 with auxiliary cable (dangerous high voltage, insulation damage at ignition coil, ignition distributor, ignition harness).

Note: Auxiliary cable must have at least 2 k Ω , interference suppression, e.g. sleeve-type suppressor (5 k Ω) 0 356 500 001.

- Perform resistance measurements only with the ignition off or with the battery disconnected (measuring instrument defective).
- To prevent the trigger box from being irreparably damaged, the secondary side of the ignition system must have at least 2 k Ω interference suppression whereby the original distributor rotor with 1 k Ω interference-suppression resistor must be installed (even in the case of radio and spark interference suppression do not use a 5 k Ω distributor rotor).





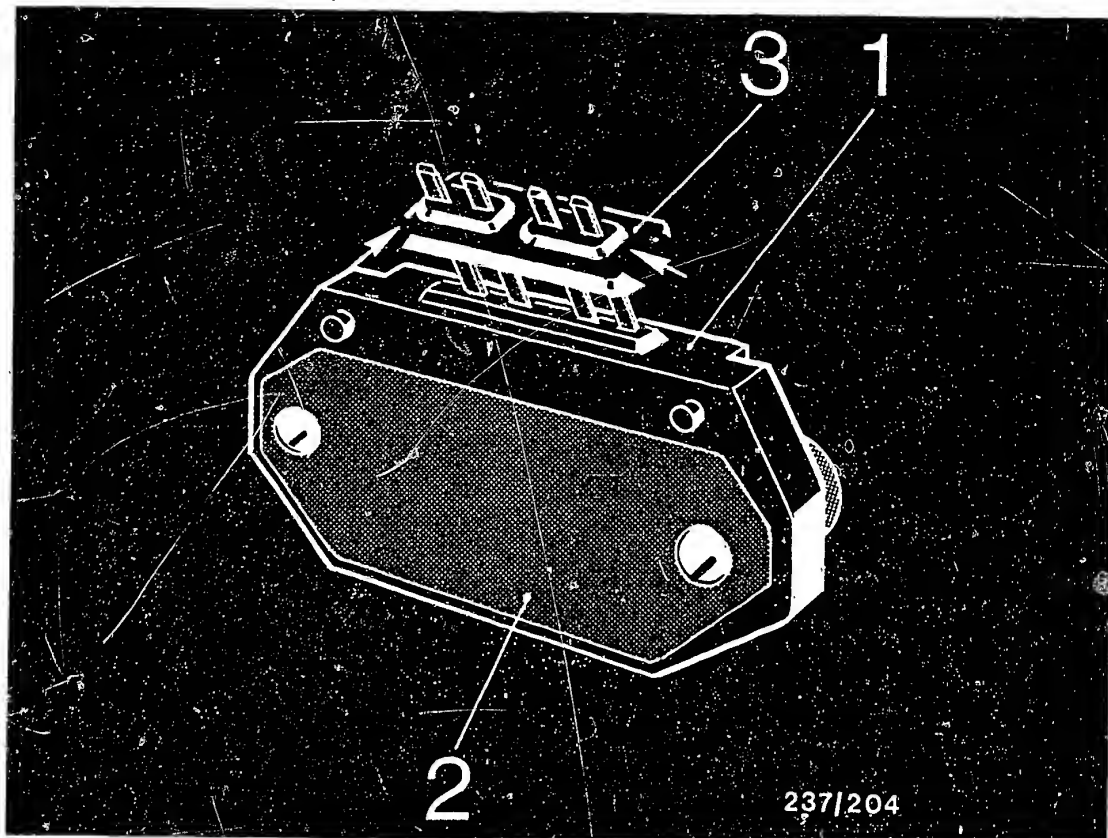
- 1 = Spark gap
- 2 = 5 k Ω sleeve-type suppressor
- 3 = Ignition coil

Danger arrows: Warning: 400 V ... 25 kV

- When using a spark gap, in order to prevent the trigger box from being irreparably damaged, an interference-suppression resistor of at least 2 k Ω must be connected between spark gap and ignition coil term. 4, e.g. sleeve-type suppressor (5 k Ω) 0 356 500 001.

- Do not disconnect battery with engine running.
- Incorrect polarity of battery will destroy trigger box and ignition coil.
- Do not use a starting aid with more than 16 V or a fast charger for starting.
- The specified ignition coil (see Part No.) must not be replaced by a different ignition coil.
- No suppression capacitor may be connected to ignition coil term. 1 and term. 15.
- Ignition coil term. 1 must not be grounded as a theft-proofing measure (with "ignition on" ignition coil will be destroyed).
- No battery + or test lamp may be connected to ignition coil term. 1 (trigger box will be destroyed).
- Ignition cable between ignition coil term. 4 and ignition distributor term. 4 must not be disconnected during operation.
- There must be no voltage arcing between ignition coil term. 4 and ignition coil term. 1 and 15. Trigger box may be destroyed.
- Arcing or breakdown at the ignition distributor cap (poor insulation) may destroy trigger box.





1 = Trigger box
(older version)

2 = Base plate
3 = Rubber seal

Coat base plate of trigger box (picture) with thermal conduction paste before mounting on the ignition distributor.

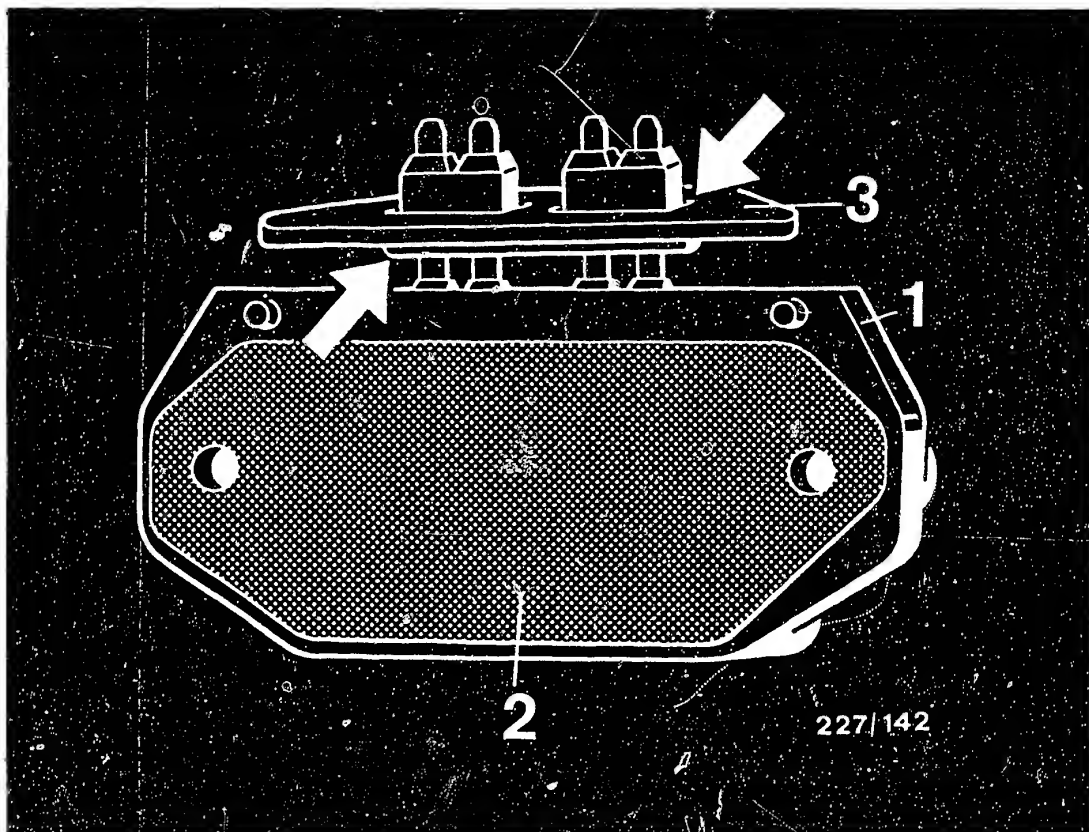
The thermal conduction paste must be applied with a suitable object (screwdriver, matchstick etc.). Do not apply any thermal conduction paste to painted parts.

Coat rubber seal on seating surface to ignition distributor (see arrows) with silicone paste.

Note:

Bosch trigger boxes can be mounted on Lucas ignition distributors.





1 = Trigger box
(newer version)

2 = Base plate
3 = Rubber seal

Coat base plate of trigger box (picture) with thermal conduction paste before mounting on the ignition distributor.

The thermal conduction paste must be applied with a suitable object (screwdriver, matchstick etc.). Do not apply any thermal conduction paste to painted parts.

Fill grease chambers of rubber seal on top and bottom sides (see arrows) with silicone grease.

Note:

Bosch trigger boxes can be mounted on Lucas ignition distributors.



10. Trouble-shooting program

Procedure

The trouble-shooting program is divided into 3 rows of boxes.

The left-hand row contains test instructions and test specifications.

The center row contains repair instructions.

The right-hand row contains the illustrations/terminal diagrams belonging to the text and explains the illustrations.

If the questions in the left-hand row can be answered conclusively with "yes", proceed to the next test down.

If the answer to the question is "no", branch to the center row and carry out the tests given there.

Make sure of the following before testing:

Battery fully charged, fuel system O.K., engine mechanically O.K. (e.g. compression, valve clearance etc.).
Ambient temperature/ignition system temperature 0° to + 100° C (temperature has a substantial influence on measured values).



Start of trouble-shooting program

Starting motor operates, engine
fails to start or engine misfires
or lacks power.

yes

Continued on B 3



yes

Check primary signal. If no oscilloscope or tachometer available, check whether ignition spark across spark gap.

Primary signal with oscilloscope
Connect oscilloscope to ignition coil according to operating instructions. (Use adapter for ignition coil).
Start engine.
Oscilloscope must indicate a primary voltage (of any value).

Primary signal with tachometer
Connect tachometer to ignition coil according to operating instructions. (Use adapter for ignition coil).
Start engine.
Tachometer must indicate a value (any value).

Ignition spark with spark gap
Disconnect ignition cable term. 4 from ignition coil.
Connect spark gap including sleeve-type suppressor (5 k Ω) to ignition coil. Adjust spark gap to 5 mm.
Start engine.
There must be sparks across the spark gap.

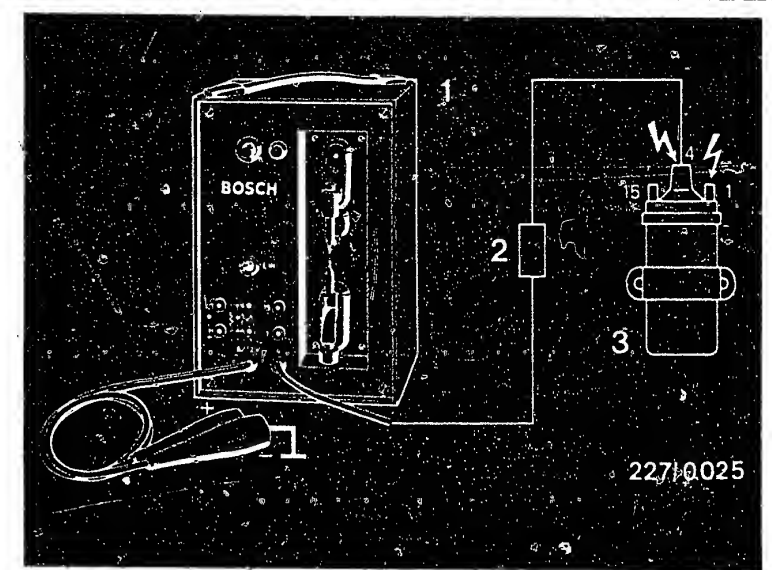
Primary signal present/ignition sparks across spark gap?

no

If no primary signal/no ignition spark, continue testing at C 1.
Tests starting on B 5 not necessary.

yes

Continued on B5/B6



1=Spark gap
2=5 k Ω sleeve-type suppressor
3=Ignition coil

Danger arrows:
Warning: 400 V ... 25 kV

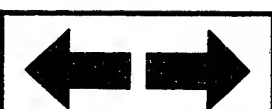
B3

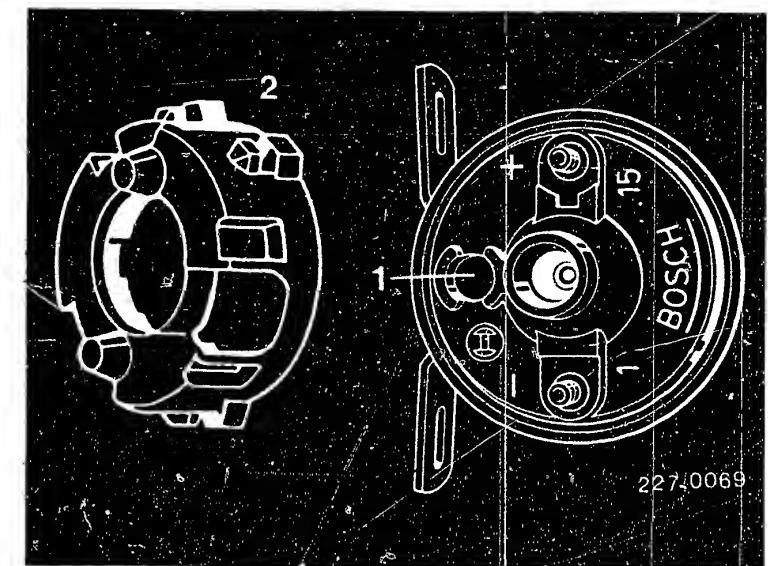
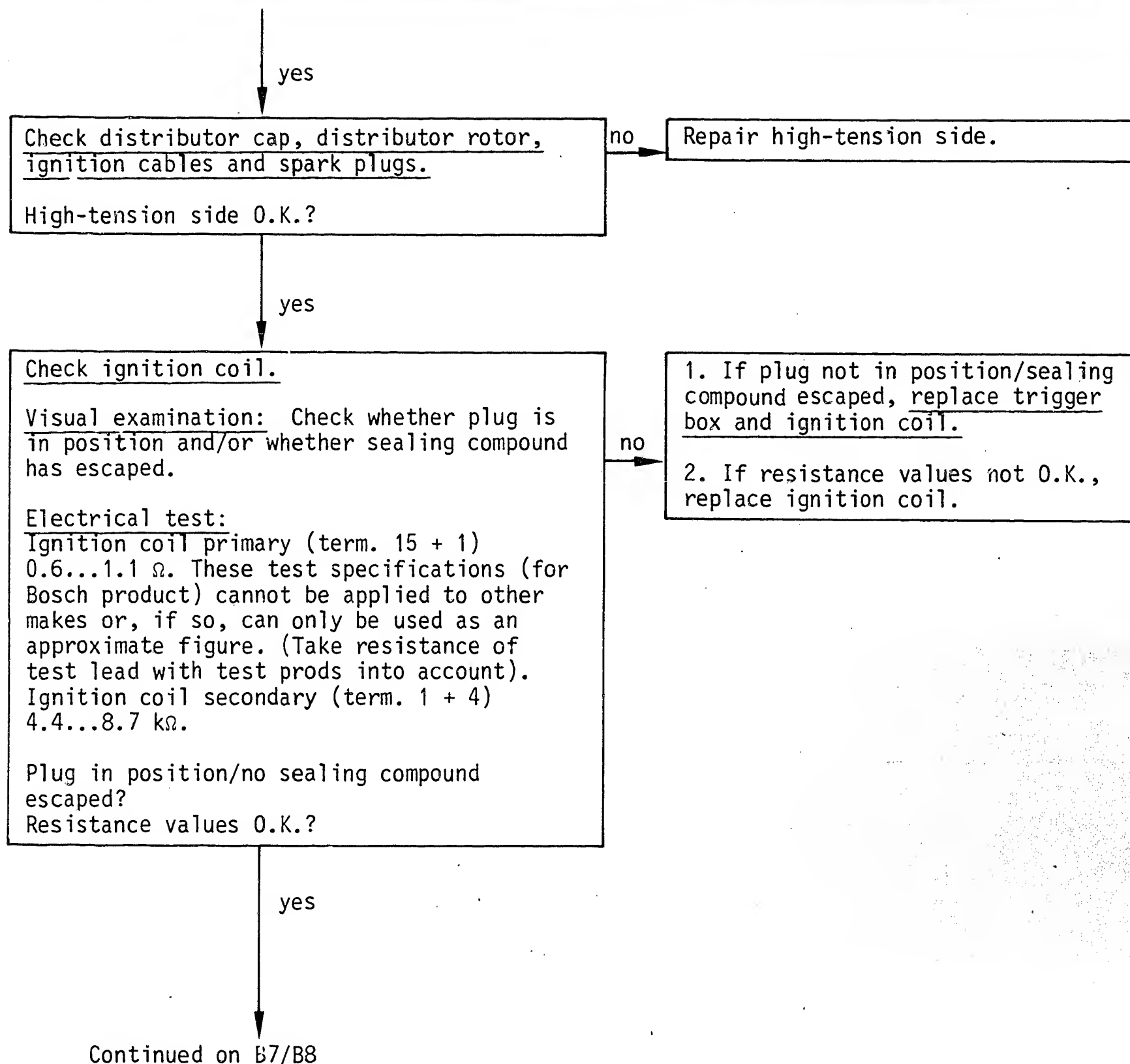
Trouble-shooting program
Ford



B4

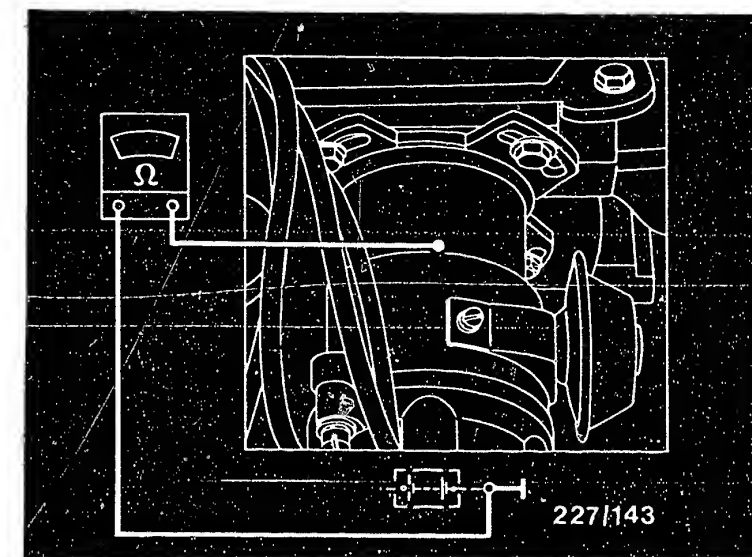
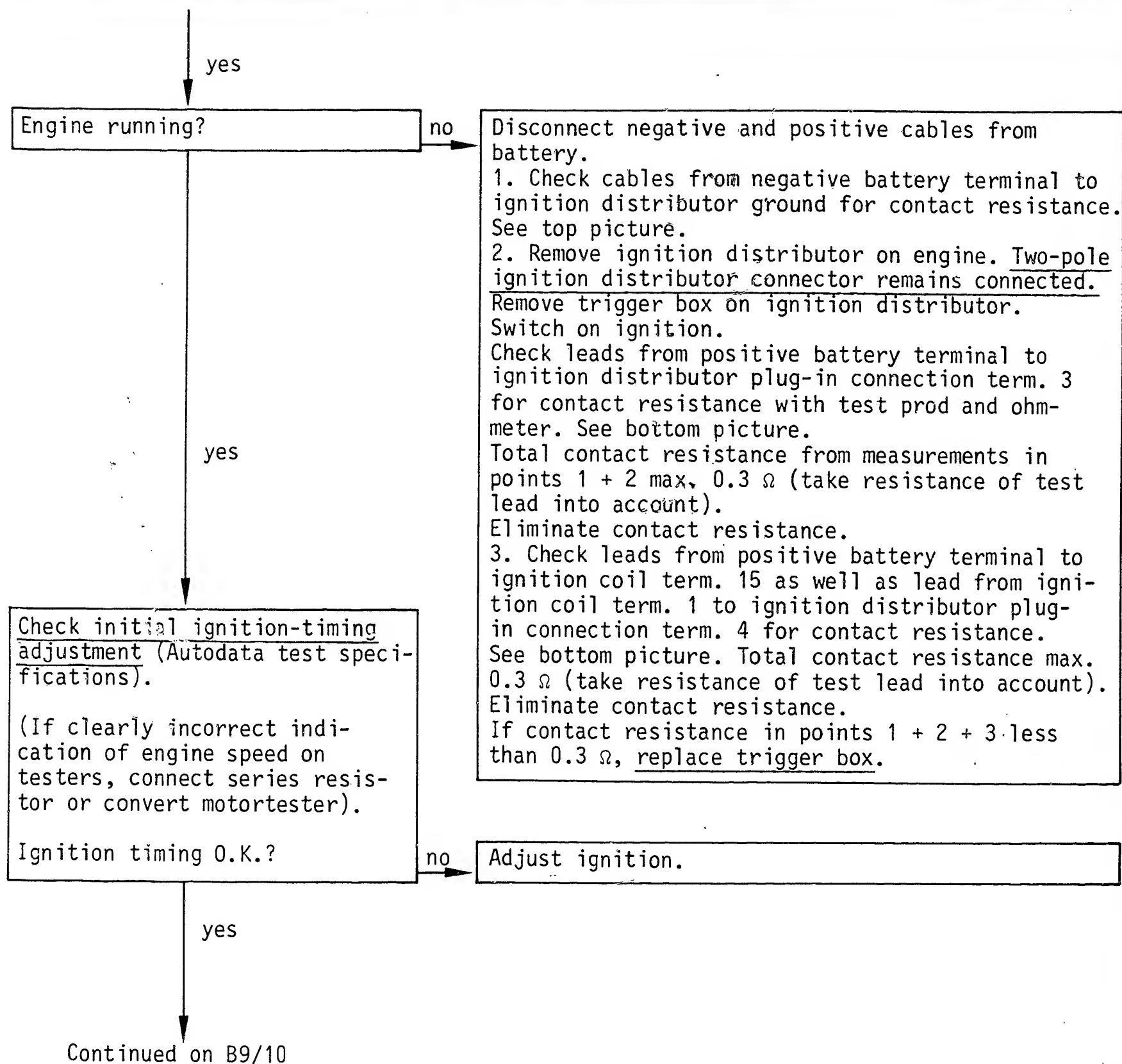
Trouble-shooting program
Ford



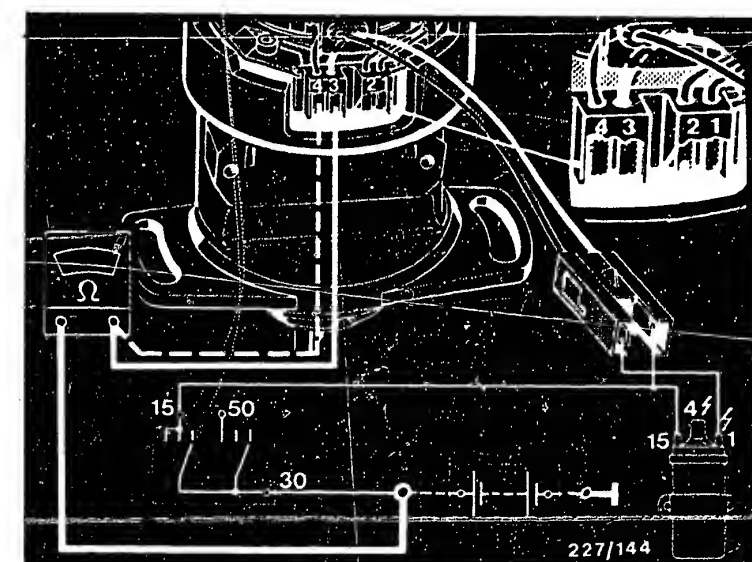


1=Plug
2=Protective cap





Danger arrows:
Warning: 400 V ... 25 kV



B7

Trouble-shooting program
Ford



B8

Trouble-shooting program
Ford



yes

Check power supply to ignition coil.

Connect adapter for ignition coil to term. 15. Connect voltmeter to adapter and negative battery terminal. Run engine at idle. The measured voltage must be at least 11.0 V. Voltage O.K.?

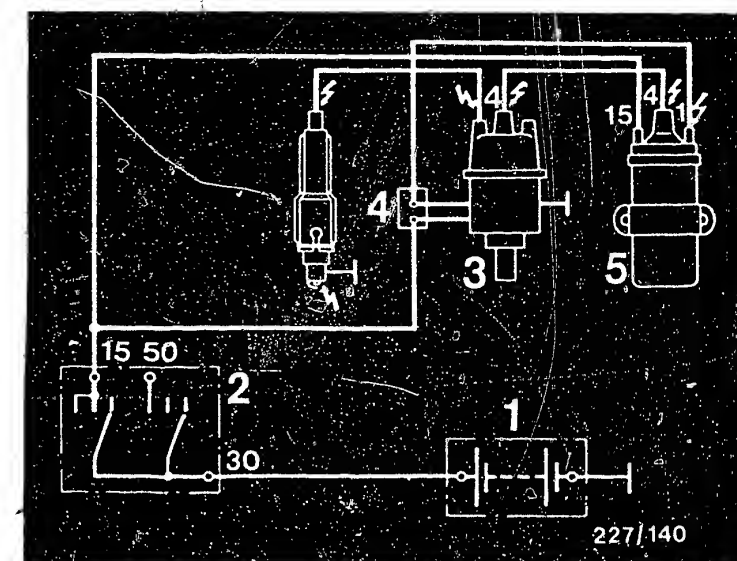
no

Disconnect positive lead from battery. Switch on ignition.

Check leads from positive battery terminal to ignition coil term. 15 for contact resistance. Contact resistance max. 0.3Ω (take resistance of test lead with test prods into account). Eliminate contact resistance.

yes

Continued on B11/12



- 1=Battery
- 2=Ignition and starting switch
- 3=Ignition distributor with trigger box
- 4=two-pole ignition distributor connector
- 5=Ignition coil

Danger arrows:
Warning: 400 V ... 25 kV

B9

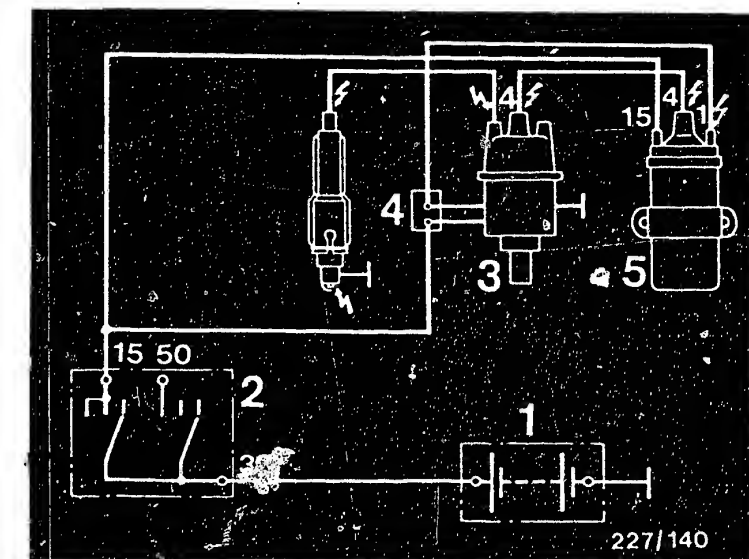
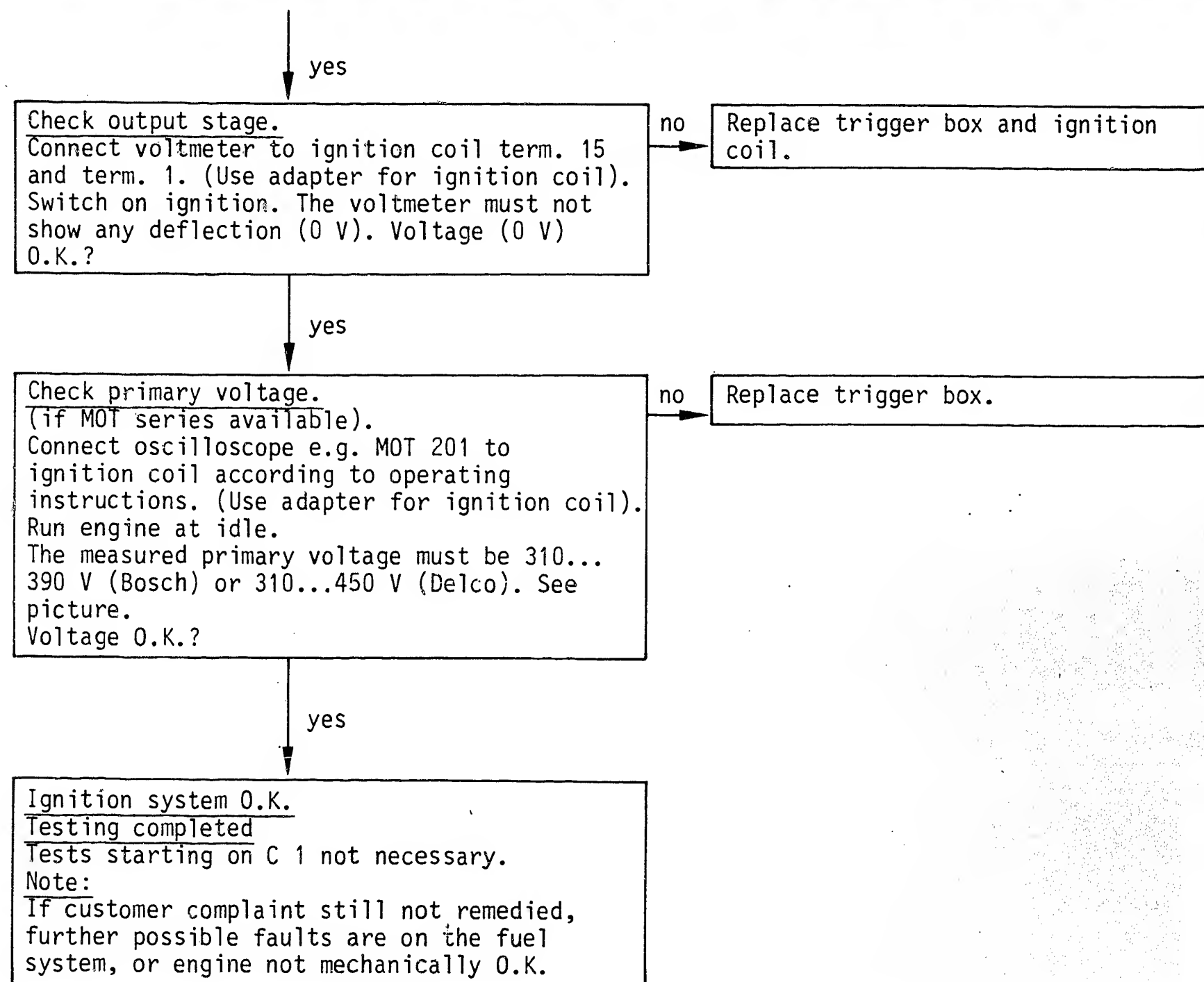
Trouble-shooting program
Ford



B10

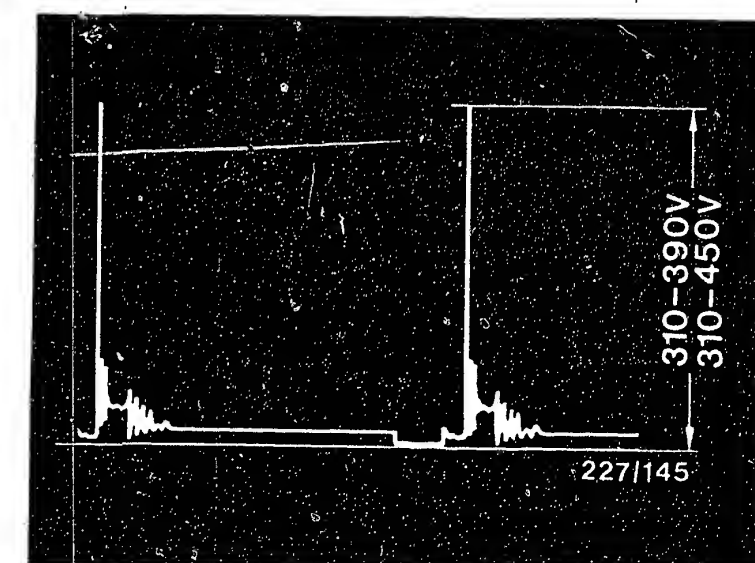
Trouble-shooting program
Ford





1=Battery
2=Ignition and starting switch
3=Ignition distributor with trigger box
4=two-pole ignition distributor connector
5=Ignition coil

Danger arrows:
Warning: 400 V ... 25 kV



B 11

Trouble-shooting program
Ford



B 12

Trouble-shooting program
Ford



No primary signal/no ignition spark
(continued from B3)

yes

Check resistance of coil section including electric lead.

Remove ignition distributor on engine. Remove trigger box on ignition distributor. Connect ohmmeter with test prods to ignition distributor plug-in connection term. 1 and term. 2. See top picture.

Resistance 630-1150 Ω (Bosch).

Resistance 2.7-3.9 k Ω (Lucas).

Resistance O.K.?

no

Replace coil section/ignition distributor or electric lead.

yes

Check short circuit to ground of coil section and electric lead.

Connect ohmmeter with test prod to ignition distributor plug-in connection term. 1 or term. 2 and ignition distributor housing (ground). See bottom picture.

The ohmmeter must indicate infinity (∞).

Resistance value O.K.?

no

Replace coil section/ignition distributor or electric lead.

yes

Check ignition pulse generator for mechanical damage.

Visual examination: Pulse generator wheel must not brush against teeth of ignition pulse generator.

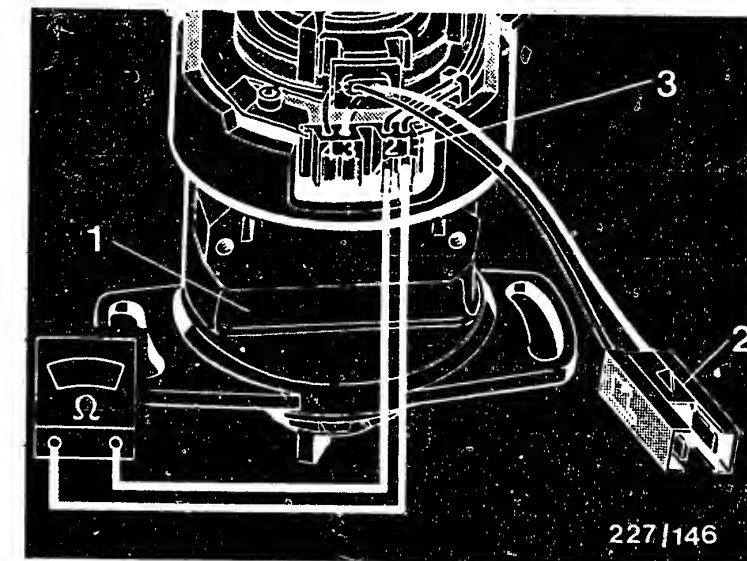
Ignition pulse generator O.K.?

no

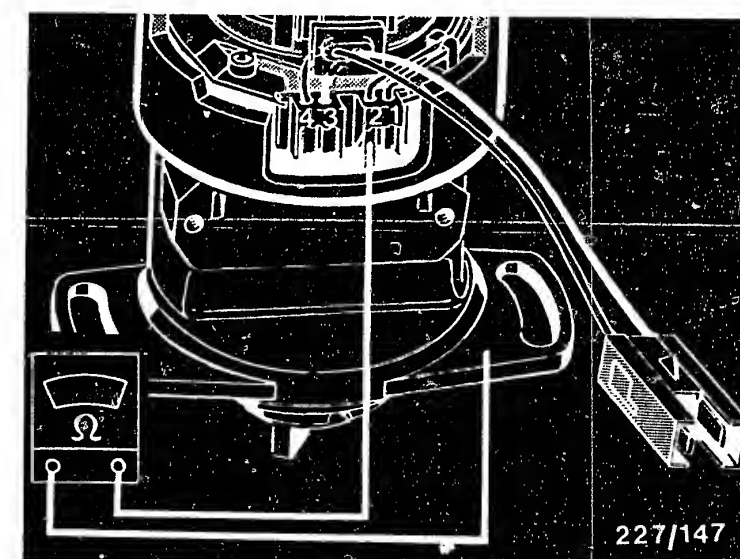
Replace ignition pulse generator/ignition distributor.

yes

Continued on C3/4



- 1=Ignition distributor with trigger box removed
- 2=two-pole ignition distributor connector
- 3=Ignition distributor plug-in connection



C1

Trouble-shooting program

Ford



C2

Trouble-shooting program

Ford



yes

Check ignition coil.

Visual examination:

Check whether plug (see top picture) is in position and/or whether sealing compound has escaped.

Electrical test:

Ignition coil primary (term. 15 + 1) 0.6... 1.1 Ω (take resistance of test lead with test prods into account).

Ignition coil secondary (term. 1 + 4) 4.4... 8.7 k Ω .

These test specifications (for Bosch product) cannot be applied to other makes or, if so, can only be applied as an approximate value. Plug in position/no sealing compound escaped? Resistance values O.K.?

no

1. If plug not in position/sealing compound escaped, replace trigger box and ignition coil.

2. If resistance values not O.K., replace ignition coil.

yes

Check power supply to trigger box and primary circuit for open circuit.

Disconnect negative and positive leads from battery.

Two-pole ignition distributor connector remains connected.

Switch on ignition.

1. Check leads from positive battery terminal to ignition distributor plug-in connection term. 3 for continuity with test prod and ohmmeter. See bottom picture.

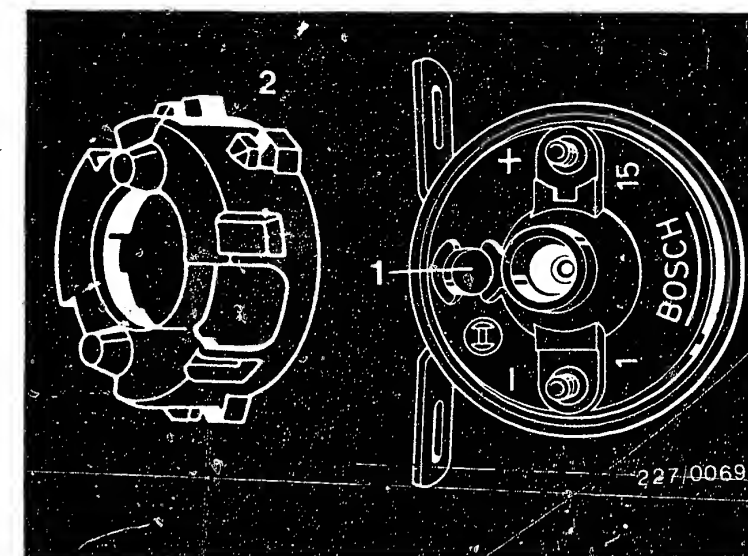
2. Check leads from positive battery terminal to ignition coil term. 15 as well as lead from ignition coil term. 1 to ignition distributor plug-in connection term. 4 for continuity. See bottom picture.

no

Eliminate open circuit.

yes

Continued on C 5

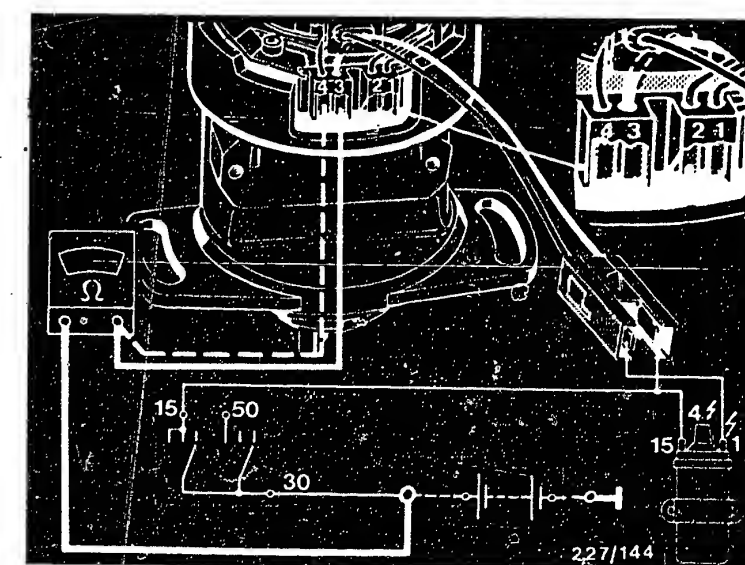


1=Plug

2=Protective cap

Danger arrows:

Warning: 400 V ... 25 kV



C3

Trouble-shooting program

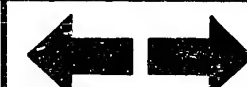
Ford



C4

Trouble-shooting program

Ford



yes

Replace trigger box.

Testing completed.

Tests from B 5 not necessary.

Note:

If customer complaint not yet remedied, further possible faults are on the fuel system or engine not mechanically O.K.



After-sales Service

Technical Bulletin

Only for use within the Bosch organization. Not to be communicated to any third party.

22

Danger of Accident on Semi-conductor Ignition Systems

VDT-I-227/102 B

11.1976

Please be sure to pass this bulletin on to your employees for their attention.

The increased demands made on their ignition systems by modern engines, and the wish for freedom from maintenance, led some time ago to manufactures starting to equip their vehicles with semi-conductor ignition systems as original equipment. In most cases the performance of nearly all makes of such systems is higher than that of conventional systems, and further improvements are to be expected. This means that semi-conductor ignition systems have reached the point where contact with "live" parts or contacts (whether on the primary side or the secondary side) can prove fatal.

In this connection we should like to point out to you that the laws valid in your country regarding work on high-voltage systems must be adhered to when working on, or testing, semi-conductor ignition systems.

As a matter of principle, when working on such ignition systems the ignition is to be switched off. Included in such work are the following operations:

- Connection of engine testing equipment (timing light, dwell-tach tester, ignition oscilloscope etc.).
- Replacement of ignition system parts (spark plugs, ignition coil, ignition distributor, H.T. ignition cables etc.).

If it is necessary to switch on the ignition in order to test the system or make adjustments on the engine (to the carburetor for instance), then lethal voltages are present throughout the entire system.

This means that the danger of accident exists not only at individual components in the system (e.g. ignition distributor, ignition coil, trigger box, ignition harness), but also at the wiring harness (e.g. connection for the tachometer, diagnostic connector), on terminals, and on test equipment.

BOSCH

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N1

Technical Bulletin

Ford

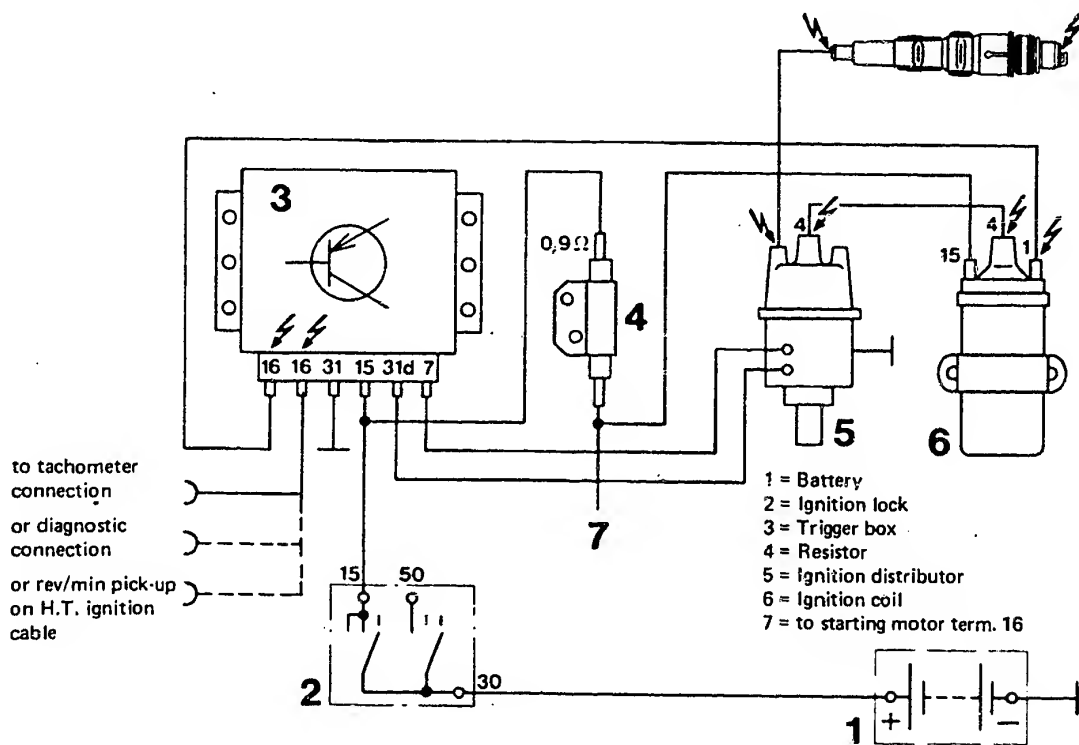


In addition, in the case of the capacitor-discharge ignition system (CDI), danger of accident is also present under the following circumstances:

- Operation of the trigger box without the ignition transformer.
- At the trigger box, (removed), relatively soon after it has been switched off (capacitor discharge).

Below is a typical terminal diagram of a semi-conductor ignition system, the danger points are marked with red high-voltage arrows. We would point out that all semi-conductor ignition systems, even the older ones, are to be regarded as dangerous in the sense as defined by this bulletin.

Please address any queries or comments concerning the contents of this publication to our representative in your country.



Terminol diogram



After-sales Service

Technical Bulletin

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EFFECTS OF ELECTRICAL AND ELECTRONIC
SYSTEMS ON HEART PACEMAKERS

VDT-I-227/107 En

1.1981

e.g. ignition systems, Jetronic, Motronic, ABS

Please ensure without fail that this Bulletin is passed on to your employees for their attention!

We have often been asked by some of our customers whether or not patients with heart pacemakers are endangered in any way by ignition systems. This theme was recently the subject of an examination carried out by the Ignition System Development Department of Robert Bosch GmbH in conjunction with Dr. Thull, lecturer at the Central Institute for Biomedical Technology at the University of Erlangen-Nürnberg and Biotronic GmbH & Co. of Berlin, a manufacturer of heart pacemakers. The magazine "Biomedizinischen Technik" (5/80) listed the results.

The most important discoveries in this practice can be summarized from the examination report as follows:-

1. Heart pacemakers corresponding to the latest state of the art are not affected by radiation (electromagnetic fields) from ignition systems.
2. With a stationary engine and the ignition switched off the heart pacemaker is not affected by any part of the ignition system, even when unintentionally touched. Maintenance work in the engine compartment, for example, can then be carried out without any danger.
3. With the engine running or stationary with the ignition switched on, touching current-carrying parts of the ignition system, as well as parts of any other electrical system, presents a certain danger for everybody. The heart pacemaker can here be affected under certain conditions (voltage, current and frequency). Patients with heart pacemakers should therefore at all costs avoid touching current-carrying parts of electrical systems.
4. Furthermore, patients with heart pacemakers are more inclined to psychic shock effects than other people, even when they receive just a harmless electric shock, because many such patients are conscious of the increased danger to the cardiac activity.

We therefore consider it inadvisable for patients with heart pacemakers to be employed in workshops or on vehicles where ignition systems are being tested or repaired. If any members of your staff have heart pacemakers please carry out the necessary measures.

BOSCH

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N3

Technical Bulletin

Ford



4. Test instructions

4.1 Standard ignition systems

Switch position: "standard"

All other tester connections as per operating instructions.

4.2 Ignition systems with current limitation

Switch position: "current limitation"

In order to trigger the timing light, the induction-type pulse generator (clamp-on pickup or red pickup) must always be connected during the measurement.

The selector switch for ignition systems built into the motortester must be switched to standard coil ignition (not to TCI) with these ignition systems.

All other tester connections as per operating instructions.

The dwell angle is electronically controlled. A measurement of the dwell angle is no longer performed.



After-sales Service

Technical Bulletin

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BREAKERLESS TRANSISTORIZED IGNITION SYSTEM

22

Warranty note

VDT-I-227/103 En
3.1979

Hybrid construction trigger boxes
0 227 100 100 for ignition distributor
with Hall generator (TCI-h)
0 227 100 102 for ignition distributor
with induction-type
pulse generator (TCI-i)

Apart from the well-known TCI trigger boxes 0 227 100 0.., trigger boxes of hybrid construction have been fitted as standard since 9.78 (Fig. 1).

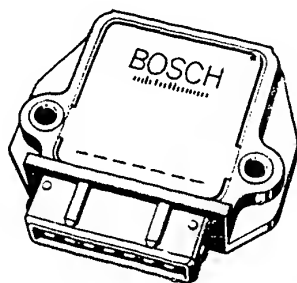


Fig. 1

Warranty procedure

If the complaints are justified, all these hybrid trigger boxes are to be sent, along with completed warranty documents, to your authorized representative for forwarding to the following address:

ROBERT BOSCH GMBH
KH/LAV - Auspackraum

zur Weiterleitung an K1/VAK 21

D-7000 Stuttgart 30

This instruction remains valid until further notice.

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N5

Technical Bulletin

Ford



After-sales Service

Technical Bulletin

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NEW DESIGNATIONS FOR IGNITION SYSTEMS

VDT-I-227/108 En

1.1983

The introduction of new ignition systems has made it necessary to reclassify all designations.

The designations listed below will be used immediately in KH workshop and sales literature.

Designation	Abbrev'd code	Meaning	Switching	Ignition control and spark advance	High-voltage distribution
Coil ignition	SZ (CI)	-----	Mechanical (breaker points)	Mechanical (ignition distributor)	Mechanical (ignition distributor)
Transistorized coil ignition	TSZ-K (TCI-c)	K=breaker-triggered	Electronic (trigger box)	Mechanical (ignition distributor)	Mechanical (ignition distributor)
Trigger box with conventional circuit techniques	TSZ-I* (TCI-i)	I=Induction-type pulse generator	Electronic (trigger box)	Mechanical (ignition distributor)	Mechanical (ignition distributor)
	TSZ-H	H=Hall generator	Electronic (trigger box)	Mechanical (ignition distributor)	Mechanical (ignition distributor)
Transistorized ignition	TZ-I* (TI-i)	I=Induction-type pulse generator	Electronic (trigger box)	Mechanical (ignition distributor)	Mechanical (ignition distributor)
(Trigger box in Hybrid technique)	TZ-H* (TI-h)	H=Hall generator	Electronic (trigger box)	Mechanical (ignition distributor)	Mechanical (ignition distributor)

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Designation	Abbrev'd code	Meaning	Switching	Ignition control and spark advance	High-voltage distribution
Breakerless semiconductor ignition with or without knock control	EZ EZ-K	- K=Knock control	Electronic (trigger box or control unit)	Electronic (control unit)	Mechanical (ignition distributor or high-voltage distributor)
Distributorless ignition with or without knock control	VZ VZ-K	- K=Knock control	Electronic (control unit)	Electronic (control unit)	Electronic (dual-spark ignition coil, or 1 ignition coil for each spark plug)

*Note: The ignition system can also be equipped with a DLS unit (digital idle stabilization) or with an ELS unit (electronic idle stabilization) or with an ESV unit (electronic ignition retardation).



After-sales Service

Motor Vehicle Service Information

Only for use within the Bosch organization. Not to be communicated to any third party.

INCORRECT DISPLAY OF ROTATIONAL SPEED AND
DWELL ANGLE ONLY WITH TRIGGER BOXES
0 227 100 ... (TCI-i, TCI-h) WITH CURRENT
LIMITATION

VDT-I-Gen. 030 En
6.80
Supersedes Ed. 3.80

For additional information see VDT-I-Gen. 032 En

1. General

In comparison with conventional ignition systems, transistorized ignition systems with current limitation have different primary voltage characteristics. During the dwell period the voltage at terminal 1 of the ignition coil may assume values from 1.5 V to battery voltage (or greater). This may lead to an incorrect display of rotational speed and dwell angle when testing the ignition system. However, there is no functional defect in the ignition system, and, for this reason, the trigger box must not be replaced. Incorrect displays may occur with the testers listed below:

MOT	001.00}	Rotational-speed	KTE	001.00
	001.01}	display O.K. with these		001.02
	001.02	testers		001.03
	001.04			
	002.00			

By now, the following vehicles may be fitted with breakerless ignition systems with current limitation:

Audi	(Bosch/Fairchild- ignition system)	Mazda	(Mitsubishi ignition system)
BMW	(Bosch ignition system)	Mitsubishi	(Mitsubishi ignition system)
Citroen	(Delco ignition system)	Nissan-Datsun	(Hitachi ignition system)
Fiat	(Delco ignition system)	Peugeot	(Bosch ignition system)
Ford	(Delco ignition system)	VW	(Bosch/Fairchild ignition system)
General- Motors	(HEI-ignition system)	Bosch transistorized ignition system for retrofitting 0 227 100 920	

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N8

Service Information

Ford



2. Test instructions

2.1 Rotational speed

Incorrect rotational-speed display can be recognized as follows:

If one starts at the idle speed and slowly increases the engine speed, then the incorrect display can be recognized by an abrupt reduction in the rotational-speed display (e.g. from 2400 min⁻¹ to 1200 min⁻¹).

It is, however, possible to attain correct rot.-speed measurements as follows:

Connect a ballast resistor of 0.9 or 1.0 Ohm (see Fig.) in series in the line to term. 15 of the ignition coil (take care not to cause a short circuit). After the rotational-speed measurement, the ballast resistor must be removed (otherwise starting difficulties and misfiring). Connect tester as per operating instructions.

Suggestion for user manufacture

Required parts:

- 1 ballast resistor 0.9 Ohm
- or
- 1 ballast resistor 1.0 Ohm
- 2 blade receptacles e.g.
- approx. 0.2 m cable, 1.5 mm² e.g.
- 2 insulated clips

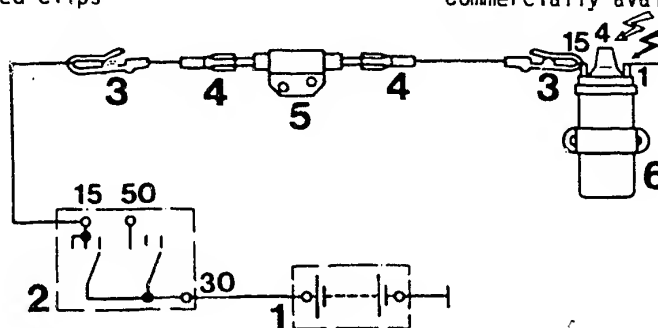
Part No. 0 227 900 002

Part No. 0 227 900 101

Part No. 1 901 355 881

Part No. 6 210 150 150

Commercially available



- 1 = Battery
- 2 = Ignition switch
- 3 = Clips

- 4 = Blade receptacle
- 5 = Ballast resistor
- 6 = Ignition coil

⚡ approx. 400 V

⚡ approx. 25 kV

2.2 Dwell angle

The dwell angle is electronically controlled. A measurement of the dwell angle is no longer performed.

2.3 Ignition point

Is displayed correctly. Connect tester as per operating instructions.



After-sales Service

Motor Vehicle Service Information

Only for use within the Bosch organization. Not to be communicated to any third party.

MOTORTESTER CONVERSION

Incorrect display of rotational speed,
dwell angle and ignition point
only with trigger boxes
0 227 100 ... (TCI-i, TCI-h) with current
limitation

VDT-I-Gen. 032 En
6.80

For additional information see VDT-I-Gen. 030 of 6.80

Re.: Motortester EFAW 268
268 S 10
269
214 B
AE 2000

1. General

Please make sure that the above-mentioned motortesters in your workshop and at your customers (e.g. motor vehicle workshops, oil companies, gas stations, vocational schools etc.) are converted. The conversion is subject to payment and is carried out by the K7 after-sales service of the responsible BG. The standard time is 15 work units (with fitting of switch).

2. Why motortester conversion?

In comparison with conventional ignition systems, transistorized ignition systems with current limitation have different primary voltage characteristics. During the dwell period the voltage at terminal 1 of the ignition coil may assume values from 1.5 V to battery voltage (or greater). This may lead to an incorrect display of rotational speed and dwell angle as well as to incorrect triggering of the meter when testing the ignition system. There is, however, no functional defect in the ignition system, and, for this reason, the trigger box must not be replaced. Since, with the above-listed motortesters, the timing light is triggered by the signal path dwell angle - meter, this incorrect triggering also leads to incorrect flashing and thus to an incorrect display of the advance angle.

3. Conversion measures

The situation is to be remedied by modifying the wiring of the testers so that the timing light is triggered by the clamp-on induction pickup and the pulse shaper stage.

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N10

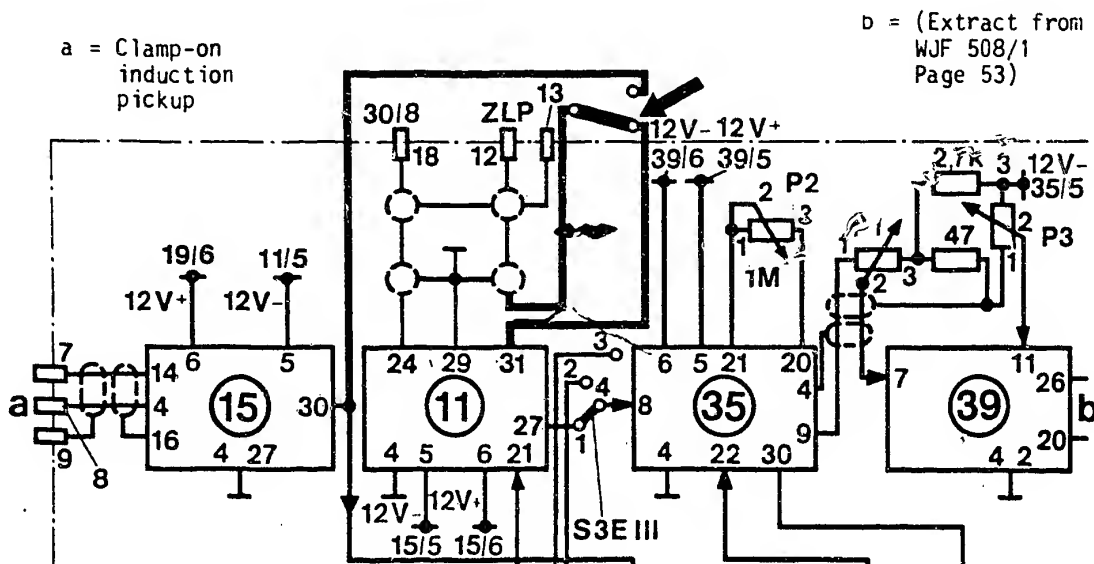
Service Information

Ford



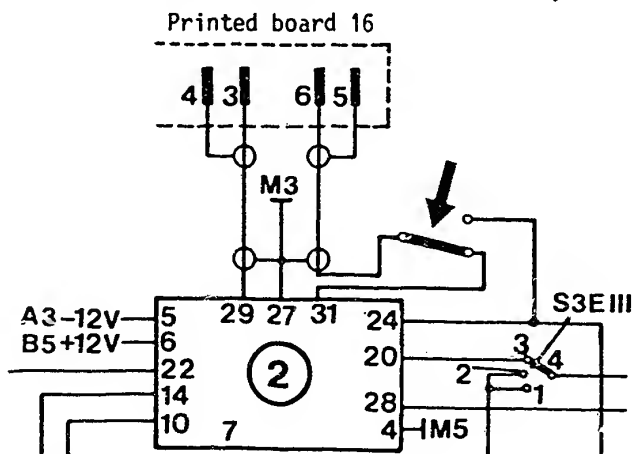
Remove the line of the ZLP* from pin 31 of printed board 11 (coupling stage) and connect to pin 30 of printed board 15 (pulse shaper stage) via a switch with change-over contact (e.g. 0 341 500 803). In addition, a new line must be connected from pin 31 of printed board 11 to the other contact of the switch with change-over contact. Arrow points to switch with change-over contact.

* ZLP = timing light



EFAW 214 B

Remove the line from terminal 6 of printed board 16 to pin 31 of printed board 2 (coupling stage) and connect to pin 24 of the same printed board via a switch with change-over contact (e.g. 0 341 500 803). In addition, a new line must be connected from pin 31 of printed board 2 to the other contact of the switch with change-over contact. Arrow points to switch with change-over contact.



By fitting the switch with change-over contact in the front panel of the motor-tester, it is possible to switch over from standard ignition systems to those with current limitation. We recommend that the switch positions be marked correspondingly: e.g. "standard" - "current limitation". These conversion measures have already been published in the K7 information sheet KJF 28/7911.



We would like to add that heart pacemakers are not expected to be affected in any way by interference from other electronic products and systems which we manufacture, such as the Antiskid System (ABS), Jetronic, Motronic, because the much greater radiation intensity of the ignition systems examined in normal use has not caused any interference to heart pacemakers corresponding to the latest state of the art.

If you should receive questions on this matter from customers, please inform them accordingly.



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